

**WHAT IS CLAIMED IS:**

1. A fuel cell system comprising a fuel cell that generates electric power through electrochemical reaction of oxygen included in an oxidizing gas, which is flown through  
5 an oxidizing gas conduit provided on a cathode side, and hydrogen included in a gaseous fuel, which is flown through a fuel gas conduit provided on an anode side, said fuel cell system further comprising:

a switching member that opens and closes an outlet of  
10 at least one of the oxidizing gas conduit and the fuel gas conduit; and

an actuation module that actuates said switching member to open and close the outlet of the at least one gas conduit.

2. A fuel cell system in accordance with claim 1, said  
15 fuel cell system comprising:

a fuel cell stack that is a laminate of a number of fuel cells; and

a gas exhaust manifold that connects with the outlet of the at least one gas conduit included in each of the fuel cells,  
20 wherein said switching member is located in said gas exhaust manifold.

3. A fuel cell system in accordance with claim 1, said fuel cell system comprising:

a fuel cell stack that is a laminate of a number of fuel cells;

an oxidizing gas exhaust manifold that connects with outlets of respective oxidizing gas conduits included in the  
5 fuel cells; and

a fuel gas exhaust manifold that connects with outlets of respective fuel gas conduits included in the fuel cells,  
wherein said switching member is located in at least one of said oxidizing gas exhaust manifold and said fuel gas exhaust  
10 manifold.

4. A fuel cell system in accordance with claim 3, wherein said fuel cell stack is divided into multiple fuel cell blocks, where each of the multiple fuel cell blocks comprises multiple fuel cells,

15 said oxidizing gas exhaust manifold is provided in each of the multiple fuel cell blocks and connects with outlets of respective oxidizing gas conduits of the multiple fuel cells included in each fuel cell block, and

said fuel gas exhaust manifold is provided in each of  
20 the multiple fuel cell blocks and connects with outlets of respective fuel gas conduits of the multiple fuel cells included in each fuel cell block.

5. A fuel cell system in accordance with claim 1, wherein

said switching member has a slit,

positioning of a remaining area of said switching member other than the slit to face the outlet of the at least one gas conduit narrows an opening area of the outlet of the gas conduit to or toward zero, and

positioning of the slit of said switching member to face the outlet of the at least one gas conduit widens the opening area of the outlet of the gas conduit.

6. A fuel cell system in accordance with claim 2, wherein said switching member has a slit,

positioning of a remaining area of said switching member other than the slit to face the outlet of the at least one gas conduit narrows an opening area of the outlet of the gas conduit to or toward zero, and

positioning of the slit of said switching member to face the outlet of the at least one gas conduit widens the opening area of the outlet of the gas conduit.

7. A fuel cell system in accordance with claim 6, wherein said switching member is a tubular switching member, which has the slit on a circumferential face thereof and is rotatably located in the gas exhaust manifold.

8. A fuel cell system in accordance with claim 3, wherein said switching member has a slit,

positioning of a remaining area of said switching member other than the slit to face the outlet of the at least one gas conduit narrows an opening area of the outlet of the gas conduit to or toward zero, and

5 positioning of the slit of said switching member to face the outlet of the at least one gas conduit widens the opening area of the outlet of the gas conduit.

9. A fuel cell system in accordance with claim 8, wherein said switching member is a tubular switching member, which has  
10 the slit on a circumferential face thereof and is rotatably located in the gas exhaust manifold.

10. A fuel cell system in accordance with claim 1, said fuel cell system further comprising:

an actuation control module that controls said actuation  
15 module to actuate said switching member first to narrow an opening area of the outlet of the at least one gas conduit to or toward zero and then to widen the opening area of the outlet of the gas conduit, thus generating pulsation in the gas conduit.

20 11. A fuel cell system in accordance with claim 10, wherein said actuation control module controls said actuation module to generate the pulsation in the at least one gas conduit according to a state of water flocculation in the gas conduit.

12. A fuel cell system in accordance with claim 10,  
wherein said actuation control module controls said actuation  
module to generate the pulsation in the at least one gas conduit,  
either when an output of the fuel cell exceeds a preset output  
5 level or when a measurement of integral power of the fuel cell  
exceeds a preset power level.

13. A fuel cell system in accordance with claim 10, said  
fuel cell system comprising:

a storage module that stores an output behavior of the  
10 fuel cell under condition of flocculation of water droplets  
in the at least one gas conduit,

wherein said actuation control module controls said  
actuation module to generate the pulsation in the gas conduit,  
when an observed output behavior of the fuel cell in service  
15 substantially coincides with the output behavior stored in said  
storage module.

14. A fuel cell system in accordance with claim 10,  
wherein said actuation control module controls said actuation  
module to generate the pulsation in the at least one gas conduit  
20 at regular intervals.

15. A fuel cell system comprising a fuel cell that  
generates electric power through electrochemical reaction of  
oxygen included in an oxidizing gas, which is flown through

an oxidizing gas conduit provided on a cathode side, and hydrogen included in a gaseous fuel, which is flown through a fuel gas conduit provided on an anode side, said fuel cell system comprising:

5           a fuel cell stack that is a laminate of a number of fuel cells and is divided into multiple fuel cell blocks, where each fuel cell block comprising multiple fuel cells;

          oxidizing gas exhaust manifolds, each of which connects with outlets of respective oxidizing gas conduits of the  
10 multiple fuel cells included in each fuel cell block;

          fuel gas exhaust manifolds, each of which connects with outlets of respective fuel gas conduits of the multiple fuel cells included in each fuel cell block;

          regulation modules, each of which regulates an outlet  
15 opening area of at least one of said oxidizing gas exhaust manifold and said fuel gas exhaust manifold in each fuel cell block; and

          an actuation module that actuates said regulation modules.

20           16. A fuel cell system in accordance with claim 15, said fuel cell system further comprising:

          a parameter value measurement module that measures value of a parameter relating to a level of water content in each

of the fuel cell blocks;

a water level determination module that determines the level of water content in each of the fuel cell blocks, based on the value of the parameter measured by said parameter value

5 measurement module; and

an actuation control module that controls said actuation module to actuate said regulation module in a specific fuel cell block, which has an excess level of water content determined by said water level determination module, to  
10 increase the outlet opening area of said at least one gas exhaust manifold to be greater than a preset reference area.

17. A fuel cell system in accordance with claim 16, wherein said parameter value measurement module measures an internal resistance in each of the fuel cell blocks, and

15 said water level determination module determines that a specific fuel cell block has an excess level of water content, when the observed internal resistance of the specific fuel cell block is below a preset appropriate range.

18. A fuel cell system in accordance with claim 15, said  
20 fuel cell system further comprising:

a parameter value measurement module that measures value of a parameter relating to a level of water content in each of the fuel cell blocks;

a water level determination module that determines the level of water content in each of the fuel cell blocks, based on the value of the parameter measured by said parameter value measurement module; and

5 an actuation control module that controls said actuation module to actuate said regulation module in a specific fuel cell block, which has an insufficient level of water content determined by said water level determination module, to decrease the outlet opening area of said at least one gas  
10 exhaust manifold to be smaller than a preset reference area.

19. A fuel cell system in accordance with claim 18, wherein said parameter value measurement module measures an internal resistance in each of the fuel cell blocks, and

said water level determination module determines that  
15 a specific fuel cell block has an insufficient level of water content, when the observed internal resistance of the specific fuel cell block is over a preset appropriate range.

20. A fuel cell system in accordance with claim 16, said fuel cell system further comprising:

20 a block position recognition module that recognizes a positional relation of the multiple fuel cell blocks,

wherein said actuation control module increases the preset reference area of said at least one gas exhaust manifold



in a specific fuel cell block, which is recognized to be located downward by said block position recognition module.

21. A fuel cell system in accordance with claim 18, said fuel cell system further comprising:

5       a block position recognition module that recognizes a positional relation of the multiple fuel cell blocks,

          wherein said actuation control module increases the preset reference area of said at least one gas exhaust manifold in a specific fuel cell block, which is recognized to be located  
10       downward by said block position recognition module.

22. A vehicle with a fuel cell system in accordance with claim 1 mounted thereon.

23. A vehicle with a fuel cell system in accordance with claim 15 mounted thereon.

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